

H10787

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

## DESCRIPTIVE REPORT

Type of Survey ..... Hydrographic .....  
Field No. .... RA-10-33-97 .....  
Registry No. .... H-10787 .....

### LOCALITY

State ..... Alaska .....  
General Locality Northwest Prince William Sound  
Sublocality The Finger Inlets, Greystone .....  
and Deepwater Bays .....

1997

### CHIEF OF PARTY

CAPT Alan D. Anderson, NOAA

### LIBRARY & ARCHIVES

DATE ..... JAN 20 1999 .....

HYDROGRAPHIC TITLE SHEET

H-10787

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

RA-10-33-97

State Alaska

General locality Northwest Prince William Sound

Locality The Finger Inlets, Greystone and Deepwater Bays

Scale 1:10,000 Date of survey October 6 - 30, 1997

Instructions dated 8/27/97, Change #1 9/24/97 Project No. OPR-P125-RA

Vessel NOAA Ship RAINIER Launches (2122), (2124), (2125), (2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by CAPT A. Anderson, LT G.Noll, LCDR D. Kruth, LT S.Lemke, LT K.Bailey,  
CST J. Fleischmann, SST N. Quanbeck

Soundings taken by echo sounder, ~~hand lead~~ DSF-6000N, Knudsen 320M

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: R. Davies Automated plot by Design Jet 650C

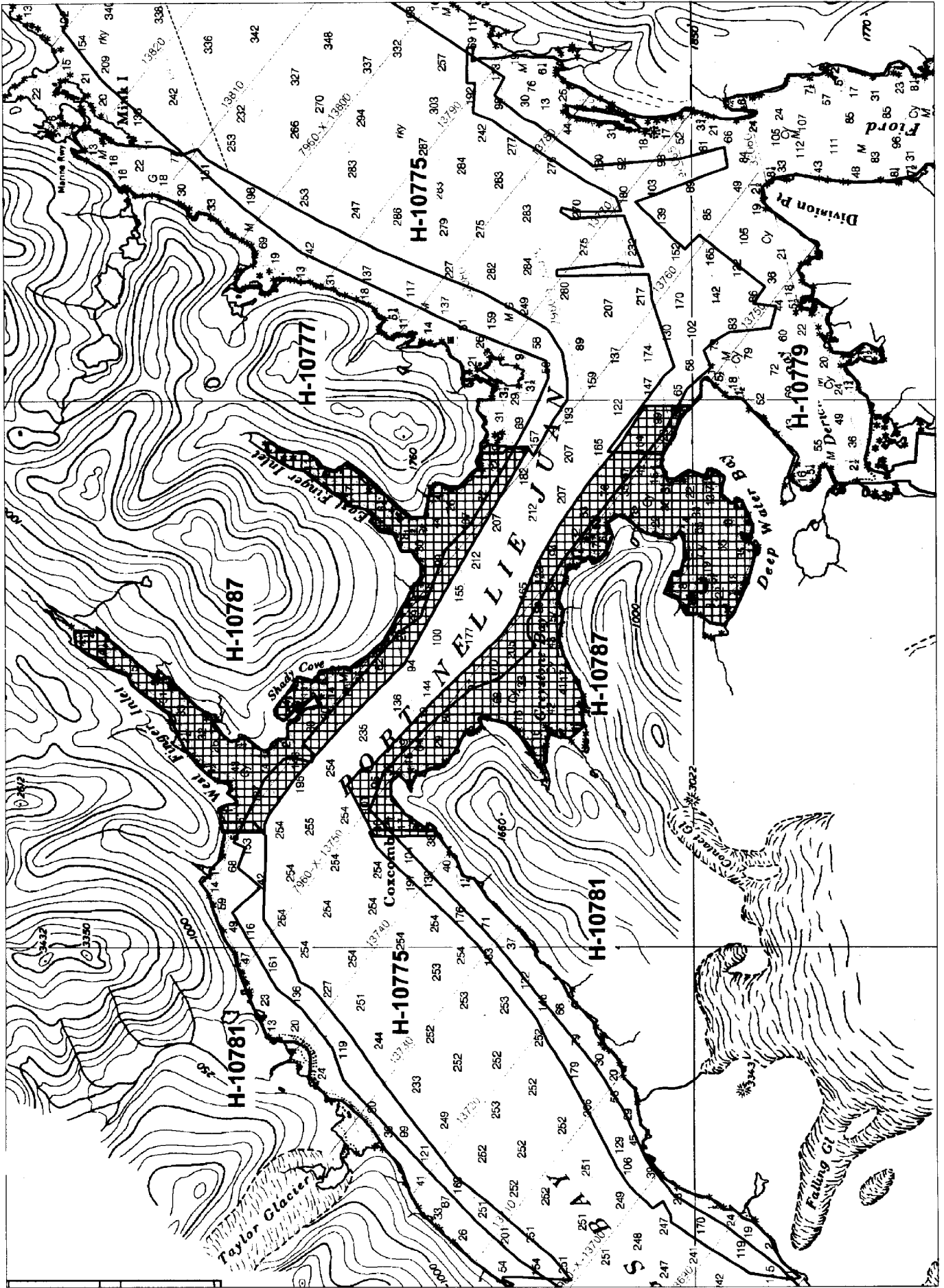
Verification by R. Davies

Soundings in fathoms ~~xxxx~~ at ~~MLLW~~ MLLW and tenths

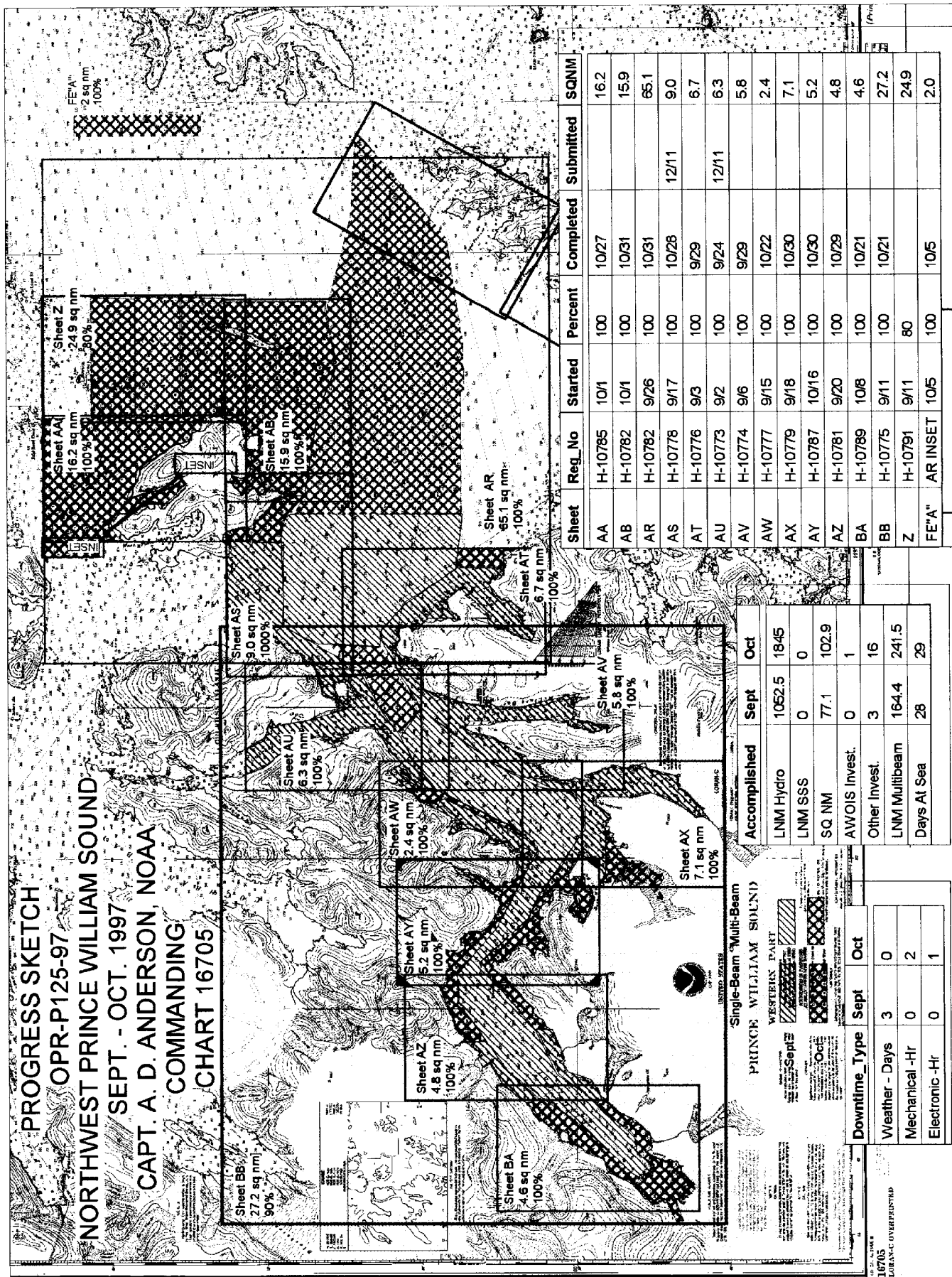
REMARKS: Time in UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to mean lower low water unless otherwise noted.

AWOP/SUIF  
1/11/99  
mcR



**PROGRESS SKETCH**  
**OPR-P125-97**  
**NORTHWEST PRINCE WILLIAM SOUND**  
**SEPT. - OCT. 1997**  
**CAPT. A. D. ANDERSON, NOAA**  
**COMMANDING**  
**CHART 16705**



Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
AA	H-10785	10/1	100	10/27		16.2
AB	H-10782	10/1	100	10/31		15.9
AR	H-10782	9/26	100	10/31		65.1
AS	H-10778	9/17	100	10/28	12/11	9.0
AT	H-10776	9/3	100	9/29		6.7
AU	H-10773	9/2	100	9/24	12/11	6.3
AV	H-10774	9/6	100	9/29		5.8
AW	H-10777	9/15	100	10/22		2.4
AX	H-10779	9/18	100	10/30		7.1
AY	H-10787	10/16	100	10/30		5.2
AZ	H-10781	9/20	100	10/29		4.8
BA	H-10789	10/8	100	10/21		4.6
BB	H-10775	9/11	100	10/21		27.2
Z	H-10791	9/11	80			24.9
FE'A"	AR INSET	10/5	100	10/5		2.0

Accomplished	Sept	Oct
LNM Hydro	1052.5	1845
LNM SSS	0	0
SQ NM	77.1	102.9
AWOIS Invest.	0	1
Other Invest.	3	16
LNM Multibeam	164.4	241.5
Days At Sea	28	29

Downtime_Type	Sept	Oct
Weather - Days	3	0
Mechanical -Hr	0	2
Electronic -Hr	0	1

16705  
 LORAN-C OVERPRINTED

# Descriptive Report to Accompany Hydrographic Survey H-10787

Field Number RA-10-33-97

Scale 1:10,000

October 1997

**NOAA Ship RAINIER**

Chief of Party: Captain Alan D. Anderson, NOAA

## A. PROJECT ✓

This basic hydrographic survey was performed in Northwest Prince William Sound as specified by Project Instructions OPR-P125-RA dated August 27, 1997 and change number 1 dated September 24, 1997. Survey H-10787 corresponds to sheet AY as defined in the sheet layout. This survey will provide data to supersede surveys performed in 1961 and earlier. Requests for hydrographic surveys and updated charts in this area have been received from the Defense Mapping Agency, the U.S. Coast Guard, the Southwest Alaska Pilot's Association, cruise ship lines, and local fishermen.

## B. AREA SURVEYED ✓ See Eval Rpt., Section B.

The area of this survey includes the East and West Finger Inlets, Greystone Bay, Deepwater Bay, and the adjacent inshore waters. The survey is bisected by the multibeam survey H-10770 in the main channel of Port Nellie Juan. The northern limit is latitude  $60^{\circ} 35' 31''$  N, the southern limit is  $60^{\circ} 29' 27''$  N, the western limit is  $148^{\circ} 28' 00''$  W and the eastern limit is  $148^{\circ} 20' 30''$  W. Data acquisition was conducted from October 6 to October 30, 1997 (DN 279 – DN 303).

## C. SURVEY VESSELS ✓

Data were acquired by RAINIER survey launches RA-2, RA-4, RA-5, RA-6, as noted in the Survey Information Summary printout <sup>attached</sup> ~~appended~~ to this report. RA-1 was used as a dive platform for dive and data were manually entered into HDAPS.

## D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All data were acquired and preliminary processing was accomplished using the Hydrographic Data Acquisition and Processing System (HDAPS). Using the sounding and shoreline data in MapInfo facilitated charted and prior survey comparisons. Final Detached Positions and Soundings based on predicted tides were saved in MapInfo 4.1 format. A complete listing of software for HDAPS is included in Appendix VI.\*

## E. SONAR EQUIPMENT ✓

Neither Side Scan Sonar nor multi-beam echo sounder equipment were used on this survey. Concur

## F. SOUNDING EQUIPMENT See Eval Rpt., Section P.

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts. DSF-6000N soundings generally were acquired in meters using the High + Low, high frequency digitized setting, but in depths over 300 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace. This caused some soundings to read shoaler than the junction survey H-10775 because of the wider beam. The hydrographer recommends using the multibeam soundings when there is a discrepancy between this survey and the junction offshore of the 150-fathom contour. <sup>(copy)</sup> Final plotted soundings have been shown on the smooth sheet in fathoms.

\* Filed with the hydrographic data

## G. CORRECTIONS TO ECHO SOUNDINGS

Four sound velocity casts outside the survey area were used as shown in the appended Survey Information Summary report; the temporally closest cast was applied to the single-beam data. The profiles were acquired with SBE SEACAT Profiler (S/N 219), calibrated December 15, 1996. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.3 (1997), in accordance with Field Procedures Manual (FPM) section 2.4.3. Printouts of the sound velocity profile, data, and correctors used in field processing are included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". \*

A static transducer depth was determined using FPM Fig 2.2 for vessels 2122, 2124, 2125 and 2126 in the spring of 1997. The static draft and offsets for RAINIER, 2120 were collected in 1995. Settlement and squat correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2, using FPM Fig. 2.3, and are included with project data for OPR-P125-RA-97. The data for vessel 2122 were collected in Shilshole Bay, Washington in March 1997. The data for 2124 and 2126 were collected at the same location in 1996. The data for vessel 2125 were collected in Young Bay, Alaska in March 1997. All offset tables\* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 1-6 correspond to the last digit of the vessel number. The offset tables are included with project data for OPR-P125-RA-97. The launches are not equipped with heave, roll and pitch sensors.

The Coastal and Estuarine Oceanography Branch (N/OES334) through N/CS31 provided predicted tides for the project on diskette for the Cordova, Alaska reference station (945-4050). HDAPS listings of the data used in generating tidal correctors are included in Appendix V\* of this report. Tidal correctors as provided in the project instructions for H-10787 are shown on the appended Survey Information Summary report.

Valdez, Alaska (945-4240) and Cordova, Alaska (945-4050) are the primary control stations for datum determination at all subordinate stations. RAINIER personnel installed Sutron 8200 tide gages at Applegate Island (945-4794) on September 1, 1997 and Blue Fjord (945-4818) on September 5, 1997 for local datum control. A tide gage was also installed at Kings Bay (945-4951) on September 10, 1997 and removed on October 22, 1997. RAINIER personnel removed the controlling Sutron 8200 tide gages on October 30, 1997. Blue Fjord is the closest gage and should be used for final reduction barring data quality problems.

Refer to the Field Tide Notes and supporting data in Appendix V\* for individual gage performance and level closure information. This information has been forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES23 in accordance with FPM 4.2.3.

*Approved tide note, dated Feb. 5, 1998 is attached to this report.*

## H. CONTROL STATIONS *See Exam Report, section H*

The horizontal datum for this project is NAD 83. Station ROCK, recovered in 1996 and checked in 1997, was used to establish local geodetic control points for this project. See the OPR-P125-RA-97 Horizontal Control Report for more information.

## I. HYDROGRAPHIC POSITION CONTROL *See Exam Report, section I*

All soundings were positioned using differential GPS. Primary hydrographic control was based on the USCG beacons located at the Kenai Peninsula and Cape Hinchinbrook. Stations on Kodiak Island and Potato Point were also received in this area. A VHF differential reference station at ROCK and repeated on a second VHF frequency by the ship was used when possible.

Launch-to-launch DGPS performance checks\* were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two different DGPS base stations while the launches were rafted together with their GPS antennae within 2-3 meters of each other. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the USCG Beacon. Periodic comparisons and

*\* Fited with the hydrographic data*

occasional performance checks were logged with the SHIPDIM system. Some outliers were noted, but none indicated systematic or continuous errors in the beacons. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-P125-RA-97.

**J. SHORELINE** See EUTC Report, section J

The shoreline manuscript from Coastal Mapping survey CM-92012 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files from DM-10193 and DM-10194 were projected to the survey grid with OPR-P125-RA-97 geodetic parameters using program Shore version 2.0, provided by N/CS32, and plotted on the survey using HDAPS.

Limited shoreline verification was conducted in accordance with the Project Instructions. For this survey the general limit of safe navigation of a survey launch is 5-50 meters offshore of apparent low tide, generally 3-10 meters of depth at Mean Lower Low Water, except in areas of steep bathymetry. Features shown on "Shore\_Features" layer in the MapInfo workspace inshore of the NALL are the hydrographer's representation of the shoreline while slowly transiting along the shore, and are intended to aid chart compilation.

Shoreline manuscript and field features were compared to an enlargement of the BSB version of chart 16705. This raster image was registered in MapInfo and plotted at survey scale by RAINIER personnel to put charted features and soundings on the boat sheets for HDAPS field comparison. There was general agreement between the charted and manuscript shoreline and what the hydrographer found on this survey. Charted shoreline features that were not found on the manuscript were verified by field positions when offshore of the NALL; features shown on the chart which were not disproved by positions were later compared to prior survey features. The following features were carried forward from the prior surveys onto this survey. Also See EUTC Report, section m and p.

Feature	Survey	Latitude	Longitude	Hydrographer Comments
Rock	H-8593	60-34-19.0 N	148-25- <del>24.47</del> W 51.5	Rock is inshore of NALL; actually is broken ledge
Rock	H-8593	60-33-50.5 N	148-26-23.41 W	Rock is inshore of NALL; broken ledge
Rock	H-8593	60-32-31.6 N	148-26-45.81 W	2 1/4 fm shoal 25m SSE (fix 20302+1, DN 292)
Rock	H-8594	60-33-39.6 N	148-21-04.43 W	Rock not seen with 50-m line spacing
Brk Reef	H-8593	60-32-24.9 N	148-27-50.75 W	Part of foul area inshore of NALL Concur Two photogrammetric manuscript rocks plot in this area.
Rock	H-8594	60-32-52.8 N	148-21-34.18 W	Inshore of NALL and new rock
Rock	H-8594	60-29-25.6 N	148-22-36.71 W	Rock is inshore of NALL

CHART AS

✓ \*  
✓ \*  
✓ \* (2)  
✓ \*  
✓ foul area  
✓ \*  
✓ \*

Discrepancies between charted and field shoreline should thus be resolved in favor of the manuscript shoreline and field work as shown on the final field Detached Position and Bottom Sample plot. The table below lists detached positions acquired by RAINIER. These include offshore-charted features, manuscript shoreline features, and new shoreline features.

Fix	Remark	Vessel	Day	Depth (m) (FA)	Longitude (N)	Latitude (W)
90214 ✓	Rock disproval	2125	294	24.5 13.2	148:21:28.369	60:30:05.413
52146 ✓	Dive on Reef	2121	295	1.9 1.1	148:22:21.498	60:32:31.866
40332 ✓	Manuscript rock	2124	291	0.60	148:22:08.274	60:32:33.967
61736 ✓	New Rock (charted)	2126	302	0.9	148:21:35.725	60:32:53.702
40319 ✓	Manuscript rock	2124	291	-4.3	148:21:19.692	60:33:15.179
40320 ✓	Manuscript rock	2124	291	-4.3	148:21:20.437	60:33:17.989
50096 ✓	New ledge	2125	290	-1.3	148:25:41.317	60:33:37.753

CHART AS

Prior rock inshore  
PRK (prior)  
\* (2)  
\* (2)  
PART of reef around Islet  
(ledge)  
CHART Rock (4)

## K. CROSSLINES ✓

Crosslines agreed within one to two meters with mainscheme hydrography, except in areas of steep bathymetry. There were a total of 15.5 nautical miles of crosslines, comprising 16.0% of mainscheme hydrography. *Concur*

## L. JUNCTIONS *See Eval Report, section L*

This survey junctions with the following 1997 surveys: H-10777, 1:10,000 on the northeast, H-10779, 1:10,000 on the southeast, H-10781, 1:10,000 on the west, and H-10775, 1:40,000 multibeam survey in between the northern and southern portions of this survey. Soundings on these 1997 surveys were found to agree within one to two meters with good contour comparison in depths less than 100 meters, and within 5-10 meters in depths over 100 meters where the bathymetry is steep, ~~except on the southwest junction with H-10781. The offshore sounding comparison with H-10781 is not very good, with some differences as great as 50 fathoms; the multibeam soundings are consistently deeper. The hydrographer attributes these differences to beam spreading effects on the digitization algorithm of the DSF-6000N fathometer in the steep and deep bathymetry. In depths greater than 250 meters in the vicinity of Coxcomb Point, the hydrographer recommends using the soundings from H-10775 for charting purposes. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.~~

*\* Crossed out during Office Processing*

## M. COMPARISON WITH PRIOR SURVEYS *See Eval Report, section M and H-7794 (1:40,000)*

Surveys H-8593 and H-8594, both 1:10,000, and performed in 1961 are the most recently performed prior surveys. They also have the shoal-bias in deep water discussed in section L., but agree well with the present survey in shallower depths with the following exceptions, *see Eval Report for additional depths which were brought forward.*

Depth (fm)	Latitude (N)	Longitude (W)	Hydrographer's findings and Recommendation	
2.9 ✓	60-34-30.27	148-26-05.28	Not superseded by 50-meter line spacing; retain sounding	<i>Do not concur chart 2.7EA</i>
6.1 ✓	60-33-16.52	148-25-11.93	Superseded by 10-meter line spacing (6.8 fm @ fix 61,761+2) lat. 60/33/16.53N, long. 148/25/11.43W	<i>Concur</i>
11 ✓	60-31-07.97	148-25- <sup>42</sup> 33.24	Not superseded by 50-meter line spacing; retain sounding	<i>concur</i>
6.7 ✓	60-30-47.25	148-22-26.96	Superseded by 25-meter line spacing; no indication of shoal	<i>concur</i>
0.7 ✓	60-32-31.89	148-22-20.29	Foul area should retain shoalest depth found after application of final tides on H-10787; keep prior dive if applicable ( <i>concur</i> )	<i>Chart 1/2 Rk</i>
2.9 ✓	60-33-28.35	148-21-02.93	Not superseded by 50-meter line spacing; retain sounding	<i>concur</i>

Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey.

## N. ITEM INVESTIGATIONS ✓

No AWOIS items exist within the bounds of this survey. *Concur*

## O. COMPARISON WITH THE CHART *See Eval Report, section O*

Charts 16700, 1:200,000, 25<sup>th</sup> edition, 9/21/96 and 16705, 1:80,000, 16<sup>th</sup> edition, 8/24/96 are the largest scale charts covering the survey area. Comparison of soundings is described in Section M. Non-sounding features are discussed in Section J.



**Dangers to Navigation** ✓ See Euvac Report, section O. b.

The following dangers to navigation were reported to the Seventeenth Coast Guard District on November 20, 1997. Copies of the correspondence can be found in Appendix I of this report.

Feature	Chart Depth	Latitude	Longitude	Fix	Meters
Shoal ✓	3 ¼	60:30:56.7	148:22:32.8	61679+3	5.8
Shoal ✓	3 ½	60:32:46.5	148:21:55.1	20055+8	6.6
Rock ✓	1 ¼	60:34:32.2	148:26:08.8	61567+1	2.2

**P. ADEQUACY OF SURVEY** ✓ See Euvac Rpt., section P.

H-10787 is complete and adequate to supersede prior soundings and features in their common areas, except for shoreline features discussed in section J and offshore soundings discussed in section T. m and in Euvac Report, section M.

**Q. AIDS TO NAVIGATION** ✓

No navigational aids exist within the survey area. Concur

**R. STATISTICS** ✓

Refer to the Survey Information Summary attached to this report.

**S. MISCELLANEOUS** ✓

Bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. No unusual tidal currents or magnetic variations were found during this survey. Secchi disk observations were performed on a clear day east of this survey.

**T. RECOMMENDATIONS** ✓ See Euvac Report, sections m and T.

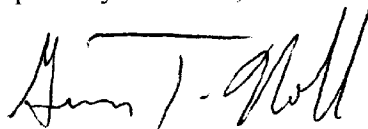
The hydrographer recommends that multibeam soundings from H-10775 offshore of Coxcomb Point be used for charting purposes in lieu of soundings from this survey, or H-10781. Agreement with multibeam soundings from H-10775 is generally good. Use of sounding data from either survey within the common area to compile chart notes is acceptable. Concur with clarification.

**U. REFERRAL TO REPORTS** ✓

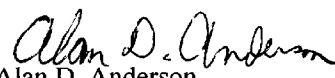
The following supplemental reports contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-P125-RA Horizontal Control Report	December, 1997	N/CS34
OPR-P125-RA 1997 Coast Pilot Report	December, 1997	N/CS26
Project related data for OPR-P125-RA	Incremental	N/CS34
OPR-P125-RA-97 Secchi Disk Observations	January 1998	N/CS34

Respectfully Submitted,

  
Guy T. Noll  
LT, NOAA

Approved and Forwarded,

  
Alan D. Anderson  
Captain, NOAA  
Commanding Officer

# Survey Information Summary

**Project:** OPR-P125-97      **Project Name:** NORTHWEST PRINCE WILLIAM SOUND

**Instructions Dated:** 8/27/97      **Project Change Info:**

Change #	Dated
1	9/24/97

**Sheet Letter:** AY      **Registry Number:** H-10787

**Sheet Number:** RA-10-33-97

**Survey Title:** GREYSTONE BAY AND THE FINGER INLETS

**Data Acquisition Dates:**      **From:** 06-Oct-97      279      **To:** 30-Oct-97      303

## Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2121								1
2122	6	4		4				
2124	1			1	1	1		
2125	3	5	3	3	3	2	3	
2126	4	3	8	6	1	2		

## Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
4		277	979	60/35/09	279-292
				147/44/27	
5		293	963	60/39/07	293-295
				147/44/49	
6		300	597.7	60/43/45	302
				147/50/30	
7		303	610	60/33/20	302
				148/13/21	

## Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS40		X0.96
PWS41		X0.97

## Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-4794	APPLEGATE ISLAND	9/1/97	10/30/97
945-4818	BLUE FIORD	9/5/97	10/30/97
945-4951	KINGS BAY	9/10/97	10/22/97

## Statistics Summary

Type	Total:
BS	19
DEV	20.36
DIVE	1
DP	6
MS	96.88
S/L	24.4
SPLIT	59.13
XL	15.53

Percent XL: 16.0%

SQNM: 5.2

CONTROL STATIONS as of 1 Dec 1999 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
1		060:14:18.000	146:38:48.000	0	0	0.0	0.0		04/06/96	CAPE HINCHINBROOK USCG BECON
2		060:27:20.117	148:39:54.333	0	0	0.0	0.0		10/01/97	DON DGPS
3		060:03:23.000	146:41:48.000	0	0	0.0	0.0		03/01/96	POTATO POINT USCG BEACON
4		060:39:13.513	147:58:26.500	18	0	0.0	0.0		00/00/00	ROCK



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**Office of NOAA Corps Operations**  
**Pacific Marine Center**  
 1801 Fairview Avenue East  
 Seattle, Washington 98102-3767

Commander (mon)  
 Seventeenth Coast Guard District  
 Post Office Box 25517  
 Juneau, Alaska 99802-5517

NOAA Ship RAINIER  
 November 21, 1997

**ADVANCE  
 INFORMATION**

Dear CDR Hamblett:

The following dangers to navigation should be included in the Local Notice to Mariners. These features were positioned by the NOAA Ship RAINIER while conducting hydrographic surveys in western Prince William Sound, Alaska. The dangers are shown graphically on the two attached chartlets. They affect chart 16705, 16TH ED., 1996, 1:80,000, and chart 16700, 25TH ED., 1996, 1:200,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

Feature Type	Depth (fm)	Latitude (N)	Longitude (W)	Position Number	Depth Meters	Survey Number
Rock	5.75	60:37:04.7	148:09:57.4	19077	10.9	H-10773
Rock	5.25	60:36:55.3	148:09:54.5	35885	9.6	H-10773
Rock	3.75	60:37:52.5	148:10:37.7	35886	7.2	H-10773
Shoal	3.25	60:31:18.0	148:13:57.4	40345+4	6.2	H-10774
Shoal	6.25	60:31:32.7	148:05:13.0	20631+5	11.7	H-10776
Shoal	8.25	60:32:01.1	148:04:03.8	40422+0	15.4	H-10776
Rock Awash	-0.25	60:31:49.7	148:20:14.6	2153	-0.3	H-10777
Rock Awash	-1.5	60:31:42.6	148:20:33.4	2183	-2.6	H-10777
Shoal	3.25	60:28:41.3	148:14:16.1	60296+3	5.9	H-10779
Shoal	6.5	60:44:17.0	147:56:55.0	20132+6	11.9	H-10785
Rock	2.5	60:44:29.0	147:56:10.7	20285+3	4.5	H-10785
Shoal	4.25	60:43:13.1	147:55:48.2	20325+5	7.7	H-10785
Rock	0.75	60:45:53.9	147:55:18.2	41053+0	1.7	H-10785
Rock	2.5	60:45:18.4	147:54:42.9	41130+3	5	H-10785
Rock	0.75	60:42:33.2	147:52:07.9	41231+0	1.5	H-10785
Shoal	5.5	60:43:43.8	147:56:17.1	41232+0	10.3	H-10785
Rock	3.5	60:43:48.5	147:56:23.9	60262+3	6.6	H-10785
Shoal	5.5	60:43:29.7	147:55:56.3	60350+3	10.1	H-10785
Rock	0.25	60:42:56.0	147:55:48.4	60485+0	0.8	H-10785
Rock	3.75	60:39:23.2	147:46:35.0	16246	7	H-10786
Rock	1.5	60:40:37.2	147:44:57.2	18846	3.3	H-10786
Rock	2.5	60:40:28.4	147:44:50.5	18944	4.6	H-10786
Shoal	8.5	60:40:14.5	147:46:59.1	19596	15.7	H-10786
Rock Awash	0	60:40:09.9	147:53:47.9	20248	0.2	H-10786
Rock	2.5	60:41:05.1	147:45:45.7	21266	4.8	H-10786
Shoal	7.25	60:40:50.5	147:50:44.1	21310	13.7	H-10786
Rock	5.25	60:39:45.0	147:51:14.9	54206	9.5	H-10786




**ADVANCE  
INFORMATION**

Feature Type	Depth (fm)	Latitude (N)	Longitude (W)	Position Number	Depth Meters	Survey Number
Rock	0.75	60:39:55.5	147:53:18.5	55197	1.7	H-10786
Rock Awash	-0.25	60:39:06.9	147:55:54.7	58138	-0.3	H-10786
Rock	6.5	60:39:18.9	147:55:12.0	58193	12.3	H-10786
Shoal	5.5	60:39:57.9	147:54:08.2	59548	10.4	H-10786
Rock	1.5	60:40:18.9	147:54:26.2	60113	2.7	H-10786
Shoal	6.25	60:40:10.4	147:54:42.7	90005	11.4	H-10786
Shoal	4.5	60:40:03.5	147:55:29.7	90007	8.6	H-10786
Rock	2.25	60:39:27.0	147:53:18.3	90010	4	H-10786
Rock	2.5	60:39:53.9	147:51:28.5	90011	4.5	H-10786
Rock	2.5	60:40:33.8	147:46:14.5	90013	4.6	H-10786
Shoal	3.5	60:32:46.5	148:21:55.1	20055+8	6.6	H-10787
Rock	1.25	60:34:32.2	148:26:08.8	61567+1	2.2	H-10787
Shoal	3.25	60:30:56.7	148:22:32.8	61679+3	5.8	H-10787
Shoal	8.75	60:41:56.2	147:43:54.7	20247+9	16.1	H-10791
Shoal	7.25	60:42:44.2	147:43:44.3	20468+3	13.5	H-10791
Rock	4	60:41:11.4	147:49:47.6	20578+3	7.4	H-10791
Rock	2.25	60:41:45.0	147:50:30.2	20630+3	4.2	H-10791
Rock Awash	-0.25	60:42:01.6	147:45:02.1	40244+0	-0.6	H-10791
Shoal	5.25	60:41:17.1	147:45:30.0	40323+2	9.8	H-10791
Shoal	6.5	60:42:08.6	147:44:06.5	40336+8	12.3	H-10791
Rock	1	60:42:02.5	147:44:41.2	40393+3	1.9	H-10791
Shoal	3.5	60:46:25.1	147:48:31.9	40459+1	6.5	H-10791
Shoal	3.25	60:44:25.0	147:49:08.0	41125+5	6.2	H-10791
Rock	0.5	60:44:49.6	147:49:02.6	41455+4	1.3	H-10791
Shoal	7.5	60:46:30.0	147:48:11.8	60637+6	13.8	H-10791

This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P125-RA-97 and Danger to Navigation message RA-7-97. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at [FOO.RAINIER@NOAA.GOV](mailto:FOO.RAINIER@NOAA.GOV).

Sincerely,

  
 Alan D. Anderson  
 Captain, NOAA  
 Commanding Officer

Attachment

cc: NIMA  
 PMC  
 N/CS261  
 N/CS34

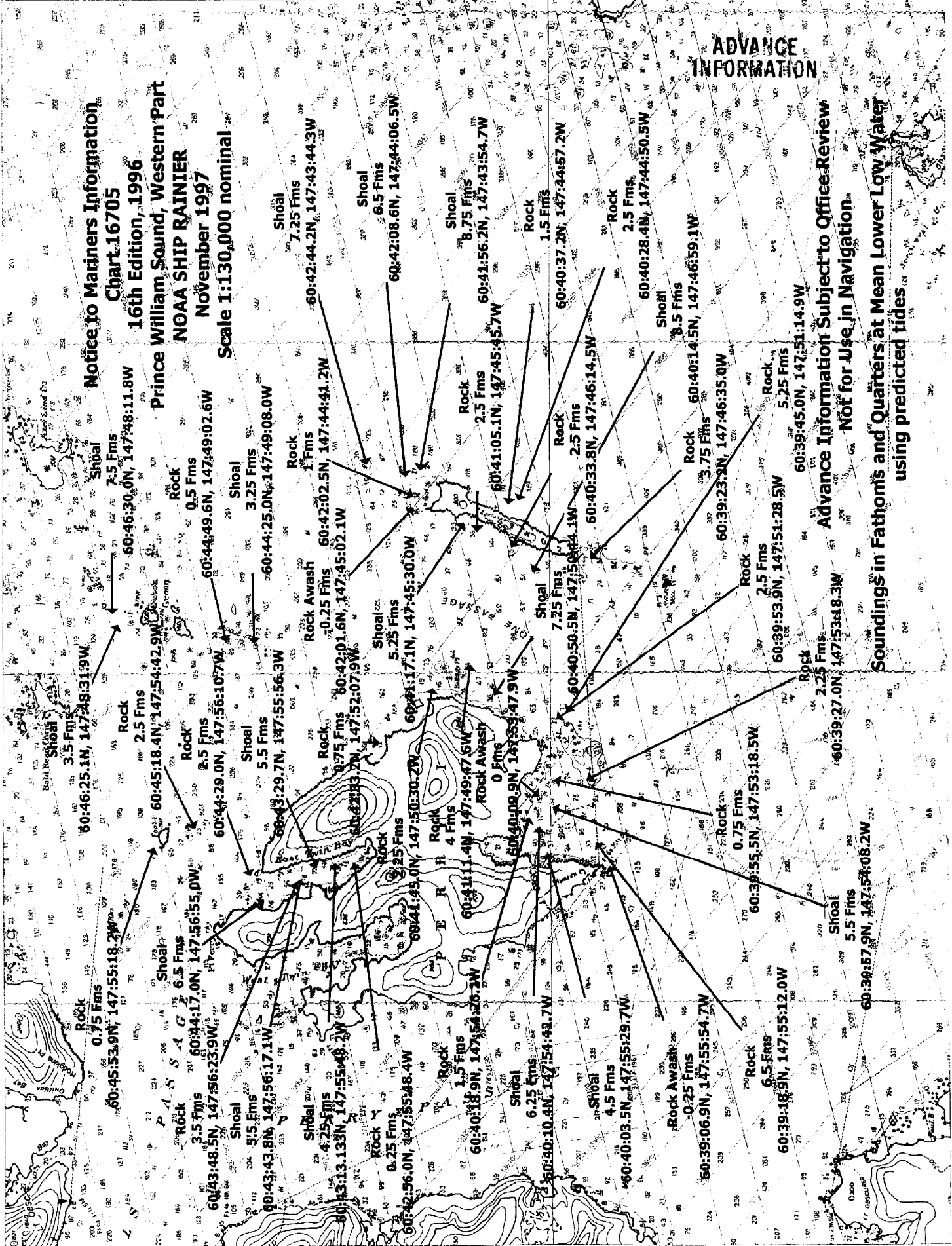
**Notice to Mariners Information**  
**Chart 16705**

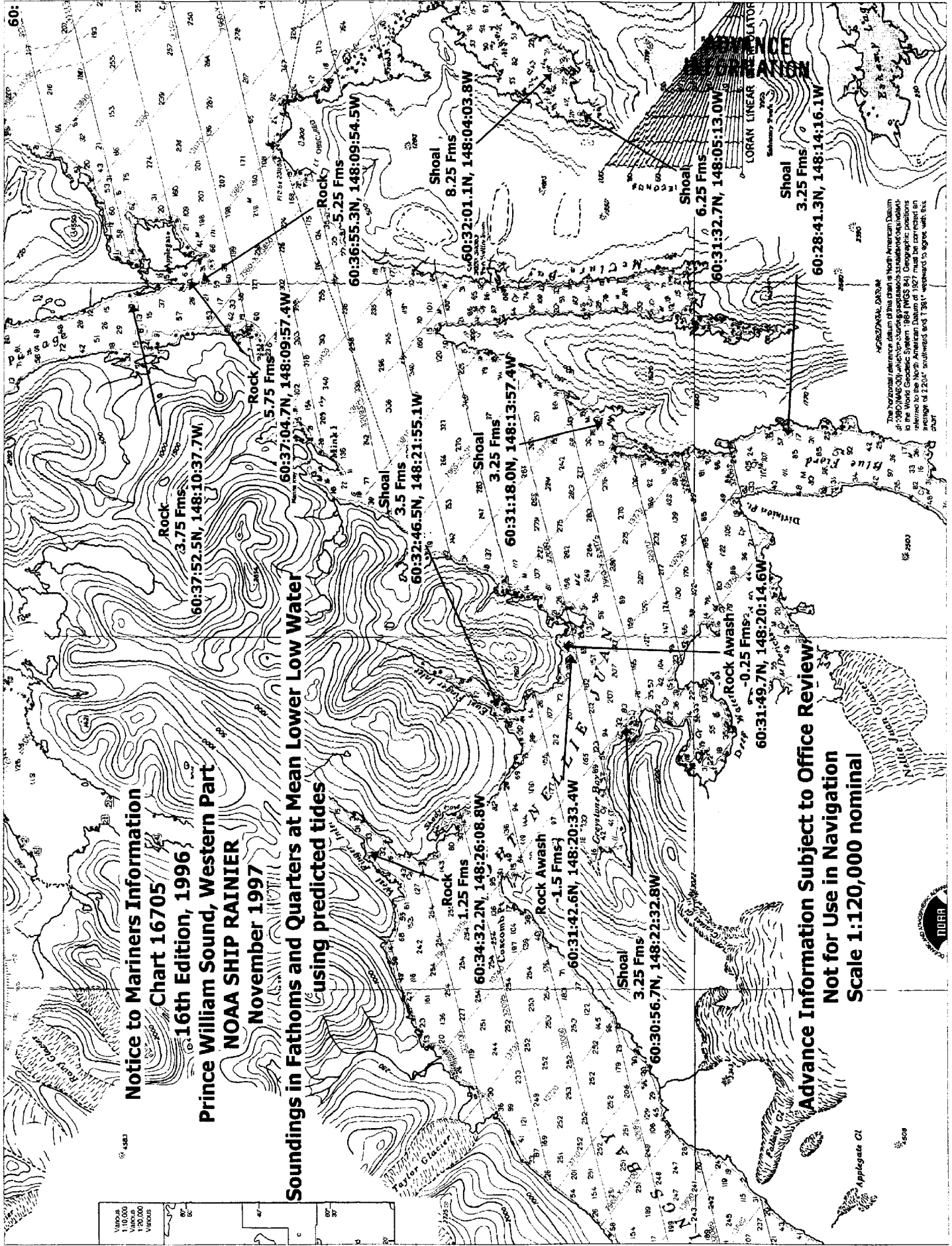
**16th Edition, 1996**  
**Prince William Sound, Western Part**  
**NOAA SHIP RAINIER**  
**November 1997**  
**Scale 1:130,000 nominal**

**ADVANCE INFORMATION**

**Advance Information Subject to Office Review**  
**Not for Use in Navigation**

**Soundings in Fathoms and Quarters at Mean Lower Low Water**  
**using predicted tides**





**Notice to Mariners Information**  
**Chart 16705**

**Prince William Sound, Western Part**  
**NOAA SHIP RAINIER**  
**November 1997**

**Soundings in Fathoms and Quarters at Mean Lower Low Water**  
**using predicted tides**

**Advance Information Subject to Office Review**  
**Not for Use in Navigation**  
**Scale 1:120,000 nominal**

Verticals	1:10,000
Horizontal	1:100,000
Verticals	1:120,000
Horizontal	1:1,200,000

WORLDWIDE POSITIONING SYSTEM (GPS) DATA  
 The horizontal reference datum of this chart is North American Datum of 1983 (NAD 83) which is a geocentric datum. The vertical datum is the World Geodetic System 1984 (WGS 84). The chart is plotted on a Mercator projection. The chart is based on a datum of 120,000 nominal and 1:120,000 nominal.



Applegate CI

1:120,000



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SERVICE

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

DATE: February 5, 1998

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA-97  
HYDROGRAPHIC SHEET: H-10787

LOCALITY: Northwest Prince William Sound, AK

TIME PERIOD: Oct 6 - Oct 30, 1997

TIDE STATION USED: 945-4794 Applegate Island  
Lat. 60° 37.4'N Lon. 148° 09.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.385 meters

TIDE STATION USED: 945-4818 Blue Fjord  
Lat. 60° 29.5'N Lon. 148° 14.7'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.407 meters

TIDE STATION USED: 945-4951 Kings Bay Inside  
Lat. 60° 27.4'N Lon. 148° 39.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.418 meters

**REMARKS: RECOMMENDED ZONING**

Use zone(s) identified as: PWS40, PWS41 & PWS41A  
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Greenwich Mean Time.

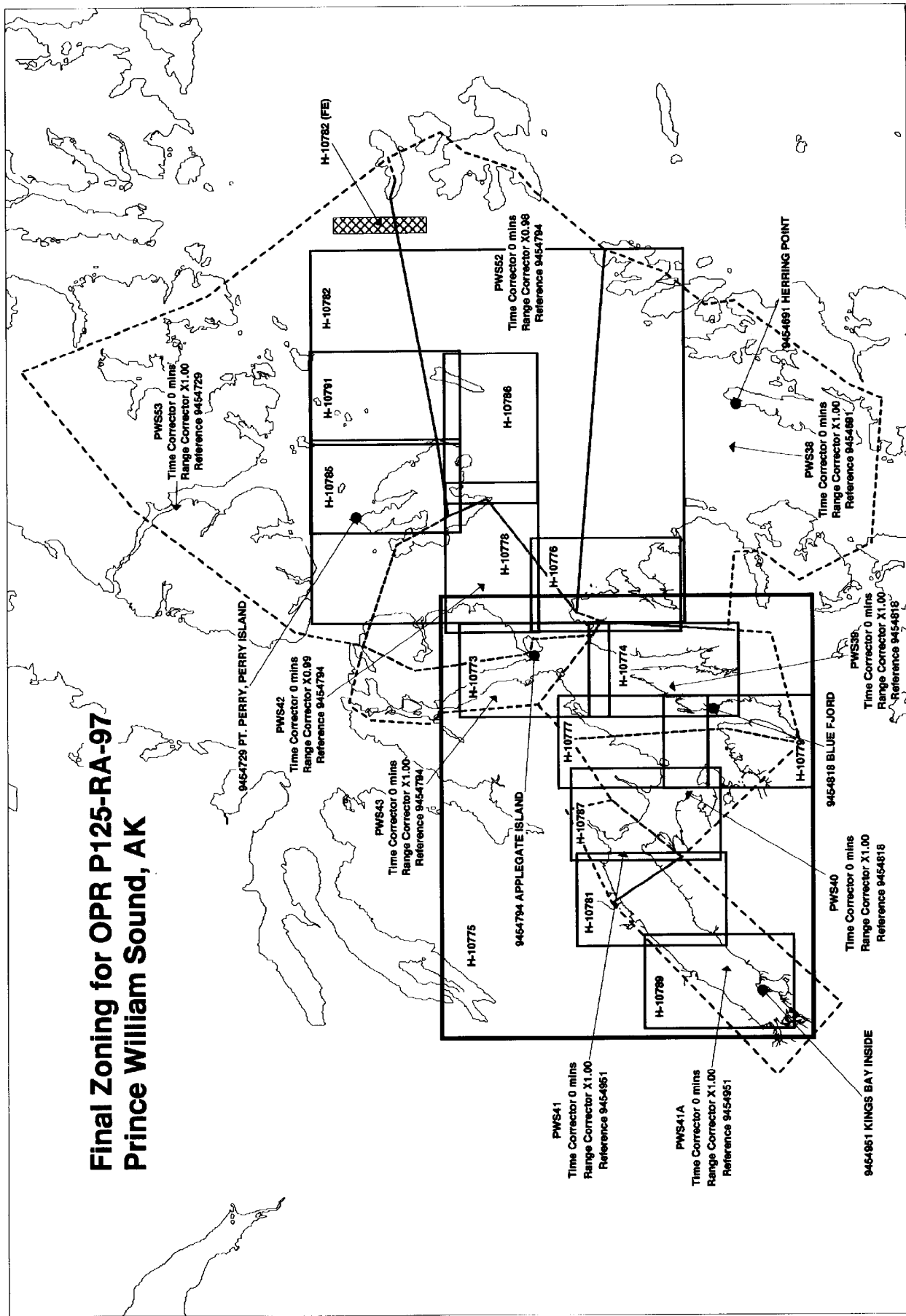
Note 2: Use tide data from the appropriate station for each zone according to the order in which they are listed in the "Tidezone" corrector files. For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available. All zones within a survey sheet may not have the same order of applicable tide stations.

-----  
*[Signature]*  
CHIEF, OPERATIONAL ANALYSIS BRANCH





# Final Zoning for OPR P125-RA-97 Prince William Sound, AK



GEOGRAPHIC NAMES

H-10787

Name on Survey	ON CHART NO. 16700-16705 B ON PREVIOUS SURVEY		CON U.S. QUADRANGLE MAPS		D FROM LOCAL INFORMATION		E ON LOCAL MAPS		F P.O. GUIDE OR MAP		G RAND McNALLY ATLAS		H U.S. LIGHT LIST		K
	A	B	C	D	E	F	G	H	I	J	K				
ALASKA (title)	X		X												1
COXCOMB POINT	X		X												2
DEEP WATER BAY	X		X												3
EAST FINGER INLET	X		X												4
GREYSTONE BAY	X		X												5
PORT NELLIE JUAN	X		X												6
PRINCE WILLIAM SOUND (title)	X														7
SHADY COVE	X		X												8
WEST FINGER INLET	X		X												9
															10
															11
															12
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															24
															25

*Approved*  
*Dennis J. Kowalsky*  
Chief Surveyor  
JUN 2 1998

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER		
<b>HYDROGRAPHIC SURVEY STATISTICS</b>				H-10787		
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.						
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION		
SMOOTH SHEET		1		SMOOTH OVERLAYS: POS., ARC, EXCESS		
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS		
DESCRIP- TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR- GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES	1					
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES				1		
SHORELINE DATA						
SHORELINE MAPS (List): <b>DM-10193 and DM-10194</b>						
PHOTOBATHYMETRIC MAPS (List): <b>NA</b>						
NOTES TO THE HYDROGRAPHER (List): <b>NA</b>						
SPECIAL REPORTS (List): <b>NA</b>						
NAUTICAL CHARTS (List): <b>Chart 16705 17th Edition, September 27, 1997</b>						
OFFICE PROCESSING ACTIVITIES <i>The following statistics will be submitted with the cartographer's report on the survey</i>						
PROCESSING ACTIVITY				AMOUNTS		
				VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET						
POSITIONS REVISED						
SOUNDINGS REVISED						
CONTROL STATIONS REVISED						
				TIME-HOURS		
				VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION						
VERIFICATION OF CONTROL						
VERIFICATION OF POSITIONS						
VERIFICATION OF SOUNDINGS						
VERIFICATION OF JUNCTIONS						
APPLICATION OF PHOTOBATHYMETRY						
SHORELINE APPLICATION/VERIFICATION						
COMPILATION OF SMOOTH SHEET				146		146
COMPARISON WITH PRIOR SURVEYS AND CHARTS						
EVALUATION OF SIDE SCAN SONAR RECORDS						
EVALUATION OF WIRE DRAGS AND SWEEPS						
EVALUATION REPORT					75	75
GEOGRAPHIC NAMES						
OTHER: <b>Chart Compilation</b>					42	42
*USE OTHER SIDE OF FORM FOR REMARKS				TOTALS		
				146	117	263
Pre-processing Examination by <b>M. Bigelow</b>				Beginning Date <b>2/13/98</b>	Ending Date <b>3/16/98</b>	
Verification of Field Data by <b>M. Bigelow, E. Domingo, R. Davies</b>				Time (Hours) <b>146</b>	Ending Date <b>8/24/98</b>	
Verification Check by <b>B. Olmstead</b>				Time (Hours) <b>6</b>	Ending Date <b>11/13/98</b>	
Evaluation and Analysis by <b>R. Davies</b>				Time (Hours) <b>75</b>	Ending Date <b>11/17/98</b>	
Inspection by <b>B. Olmstead</b>				Time (Hours) <b>4</b>	Ending Date <b>11/18/98</b>	

## **EVALUATION REPORT**

**H-10787**

### **A. PROJECT**

The hydrographer's report contains a complete discussion of the project information.

### **B. AREA SURVEYED**

The survey area is adequately described in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. A page-size plot of the charted area depicting the specific limits of suppression accompanies this report as Attachment 1.

The bottom consists mainly of mud, sand and pebbles. Depths range from 0 to 244 fathoms.

### **C. SURVEY VESSELS**

The hydrographer's report contains adequate information relating to survey vessels.

### **D. AUTOMATED DATA ACQUISITION AND PROCESSING**

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS), and MicroStation 95.

Processed digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and symbolization. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

The data is plotted using a Modified Transverse Mercator (MTM) projection and are depicted on a single sheet.

### **E. SONAR EQUIPMENT**

Side scan sonar equipment was not used during survey H-10787.

### **F. SOUNDING EQUIPMENT**

Sounding equipment has been adequately addressed in the hydrographer's report.

### **G. CORRECTIONS TO SOUNDINGS**

Soundings and elevations below Mean High Water (MHW) have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, dynamic draft, and

sound velocity. These reducers have been reviewed and are consistent with NOS specifications.

Predicted tides were used for reduction of soundings during field processing. During office processing, tide reductions were derived from approved hourly heights zoned direct from the Blue Fiord, tide gage 945-4818. This gage was used for all zones. The tide gage at Kings Bay, number 945-4951, was not used for the final reduction of data due to an inoperable tide gage. This gap in corrector values occurred from October 10th to October 22<sup>nd</sup> and coincides with times of data collection. Applegate Island, tide gage number 945-4794, as listed on the approved tide note was not used for the sounding reduction on the smooth sheet.

## **H. CONTROL STATIONS**

Section H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27-adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	-2.268 seconds	(-70.210 meters)
Longitude:	7.431 seconds	(113.282 meters)

## **I. HYDROGRAPHIC POSITION CONTROL**

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of 132 positions exceeds limits in terms of HDOP. These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable. DGPS performance checks were conducted in the field and found adequate.

NAD 83 is used as the horizontal datum for plotting and position computations.

Additional information concerning specific control system type, calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

## **J. SHORELINE**

Shorelines maps DM-10193 and DM-10194, scale 1:20,000, were compiled on NAD83 and apply to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital data as provided by the Coastal Mapping Program. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet.

The hydrographer found several new rocks, not contained in the photogrammetric data. However, these features were not positioned hydrographically. Therefore, their locations are not recorded in the digital survey records. The rocks were transferred directly from the survey field sheet to the smooth sheet. The scaled positions are listed below:

<u>Latitude(N)</u>	<u>Longitude(W)</u>
60/34/12	148/26/57
60/32/33	148/23/43
60/32/19	148/21/45
60/32/58	148/21/24
60/33/39	148/21/13
60/33/33	148/20/57
60/33/39	148/20/57
60/33/39	148/21/08
60/33/48	148/20/55
60/33/46	148/20/54

There were two MHWL revisions on this survey. These revisions have been depicted in dashed red on the smooth sheet and are adequate to supersede prior photogrammetric shoreline maps. These revisions are centered at the following positions:

<u>Latitude(N)</u>	<u>Longitude(W)</u>
60/32/02	148/26/03
60/33/35	148/25/38

The shoreline map and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

#### **K. CROSSLINES**

Crosslines are adequately discussed in the hydrographer's report.

#### **L. JUNCTIONS**

Survey H-10787 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10775	1997	1:40,000	Offshore in Port Nellie Juan
H-10777	1997	1:10,000	Northeast
H-10779	1997	1:10,000	Southeast
H-10781	1997	1:10,000	West

The junctions with surveys H-10775, H-10777, H-10779 and H-10781 are complete. A "Joins" note has been added to the smooth sheet. General differences of 0-3 fathoms are noted throughout the common areas and standard depth curves are in good agreement. Clarification regarding comments made in the hydrographer's report section L, is discussed below.

During office processing several suspected depth discrepancies from the single beam junctional surveys with H-10787 were further analyzed and found to originate from poor performance of the echo sounder on a steep slope which was surveyed at excessive vessel speed and an improper gain setting. In many instances the hydrographer attempted to correct the problem by editing the raw sounding data. However, the quality of the echo sounder trace is so poor that the edits are likely based on judgement rather than quantifiable data. Several of these anomalous depths from the junctional surveys were either rejected and or rescanned during office processing.

Agreement with multibeam survey H-10775 is good. The evaluator recommends the use of survey depths from either junctional survey within the vicinity of Coxcomb Point.

## M. COMPARISON WITH PRIOR SURVEYS

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-8593	1961	1:10,000	NAD 27
H-8594	1961	1:10,000	NAD 27

Prior surveys H-8593 and H-8594 cover the East and West Finger Inlets, Greystone Bay, Deepwater Bay, Shady Cove and along Port Nellie Juan out to approximately 150 fathoms. Comparison of depths with the prior surveys from the mean lower water line (MLLW) to approximately 30 fathoms reveals differences of 0.5-2 fathoms. Larger differences of 2-5 fathoms are readily evident when comparing with the 1961 survey work between depths of 30-50 fathoms. Much larger differences (10-50 fathoms) are seen when comparing with the prior surveys in depths exceeding 100 fathoms.

With exceptions noted below, present survey reveals a deeper bias throughout the common areas with the present survey work. These large differences occur where the bottom slopes off rapidly into Port Nellie Juan.

a. The present survey was able to collect sounding data several hundred meters further inshore at the heads of East Finger and West Finger Inlets. The present survey work is 2-4 fathoms deeper.

b. The present work found general differences of 0-1 fathom with the prior survey at the entrance of Deepwater Bay. However, significant differences in depths with the 1961 work were found in Deepwater Bay centered at latitude 60/29/45N, longitude 148/22/30W. In this area the present survey reflects differences of 5-10 fathom shoaler. A second area centered at latitude 60/29/45N, longitude 148/23/48W reflects differences of 10-20 fathoms deeper since the prior work. These differences may be attributed to earthquake or glacial activity in the areas.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-7794	1948	1:40,000	NAD 27

Prior survey H-7794 covers the center of Port Nellie Juan. The common areas of the present and prior survey are in depths of approximately 125 to 200 fathoms. Overall the comparison of depths in the common area reveals a difference in depths of 2-5 fathoms. Sounding differences is greater along the steeply sloping areas, these differences range from 4-10 fathoms. The differences may be attributed to improved positioning and sounding methods and relative accuracy of the data acquisition techniques.

In accordance with the Hydrographic Guideline No. 39, the effect of the 1964 Prince William Sound earthquake were considered in the comparison of this survey. Prince William Sound experienced a bottom uplift of 4-32 feet during the 1964 earthquake. However, due to the depths of water and the differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

Several prior survey soundings were carried forward from survey H-8593 and H-8594. The following table lists these soundings.

<u>Sounding(fathoms)</u>	<u>Latitude(N)</u>	<u>Longitude(W)</u>	<u>Survey</u>
4.6	60/35/16	148/24/32	H-8593
8.9	60/35/14	148/24/36	H-8593
11	60/31/06	148/25/42	H-8593

9.7	60/33/05	148/21/27	H-8594
5	60/32/42	148/22/06	H-8594
2	60/32/40	148/22/06	H-8594
36	60/30/13	148/21/58	H-8594
0.7 Rk	60/32/32	148/22/21	H-8594

Numerous prior survey rocks and ledges have been transferred to the present survey in color along the inshore areas of Greystone Bay, Shady Cove, Deep Water Bay, East Finger Inlet and West Finger Inlet. Most of these items fall near or inside the NALL line and were not specifically addressed by the hydrographer.

With the transfer of soundings and features from prior surveys H-8593 and H-8594, the present survey is adequate to supersede all prior surveys within the common area.

#### **N. ITEM INVESTIGATIONS**

There were no AWOIS items assigned to this survey.

#### **O. COMPARISON WITH CHART**

Survey H-10787 was compared with the following chart:

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
16705	17 <sup>th</sup>	September 27, 1997	1:80,000

##### **a. Hydrography**

Charted hydrography originates with the previously discussed prior surveys. The prior surveys have been adequately addressed in section M and require no further discussion.

Many of the charted rocks originating from prior surveys were generalized offshore. These rocks were found to be positioned further inshore and should be charted as shown on the smooth sheet.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features.

Survey H-10787 is adequate to supersede charted hydrography within the charted area.

##### **b. Dangers To Navigation**

Three dangers to navigation were discovered during survey operations and reported to the USCG on November 21, 1997. No additional dangers to navigation were found during office processing. A copy of the report is attached.

#### **P. ADEQUACY OF SURVEY**

With the exception of the following, hydrography contained on survey H-10787 is adequate to:

- a. Delineate the bottom configuration, determine least depths, and draw the required depth curves;



- b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. Show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1994 Edition with the following exceptions:

In the event that the field units submission of survey data will exceed four weeks from the completion of field work, the Chief of Party will submit a written explanation for the delay indicating the anticipated transmittal date to the Chief of the appropriate processing section. Marine Center ships will forward their explanation through the Marine Center Director. Fieldwork for survey H-10787 was completed on October 30, 1997 but not transmitted for office processing until February 15, 1998

Section J. Shoreline of the hydrographer's report contains a discussion about the comparison of the present survey to the prior surveys. This discussion appropriately belongs in Section M, Comparison With Prior Surveys. Also, the hydrographer has "carried forward" several features from the prior survey to the present survey to make it complete. This process is not permitted. The transfer of historical information to a contemporary survey implies that fieldwork is incomplete or inadequate. If hydrographers are aware of this deficiency it should be resolved through additional hydrographic survey investigation.

Some anomalous soundings were acquired during this survey. They originate from the poor performance of the echo sounder on steep slopes, which were surveyed at excessive vessel speed. The hydrographer attempted to correct the problem by editing the raw sounding data, however, the quality of the echo sounder trace is so poor in some areas that the edits are likely based on judgement rather than quantifiable data. Office review of the problem has determined that, with the exception of obviously erroneous depths, further editing is not reasonable since no corrective action can be taken to improve the quality of the trace. The judgement of the hydrographer has been accepted and generally the data was not altered during office processing. Generally, the affected depths are deep, in excess of 150 fathoms, and will have little negative effect on the quality of nautical charts if compiled at scales smaller than 1:40,000.

#### **Q. AIDS TO NAVIGATION**

There were no fixed or floating aids to navigation, which plot within the surveyed limits. There were no charted landmarks in the survey area.

#### **R. STATISTICS**

Statistics are adequately itemized in the hydrographer's report.

#### **S. MISCELLANEOUS**

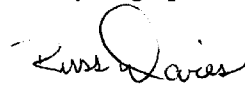
Miscellaneous information is adequately discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

#### **T. RECOMMENDATIONS**

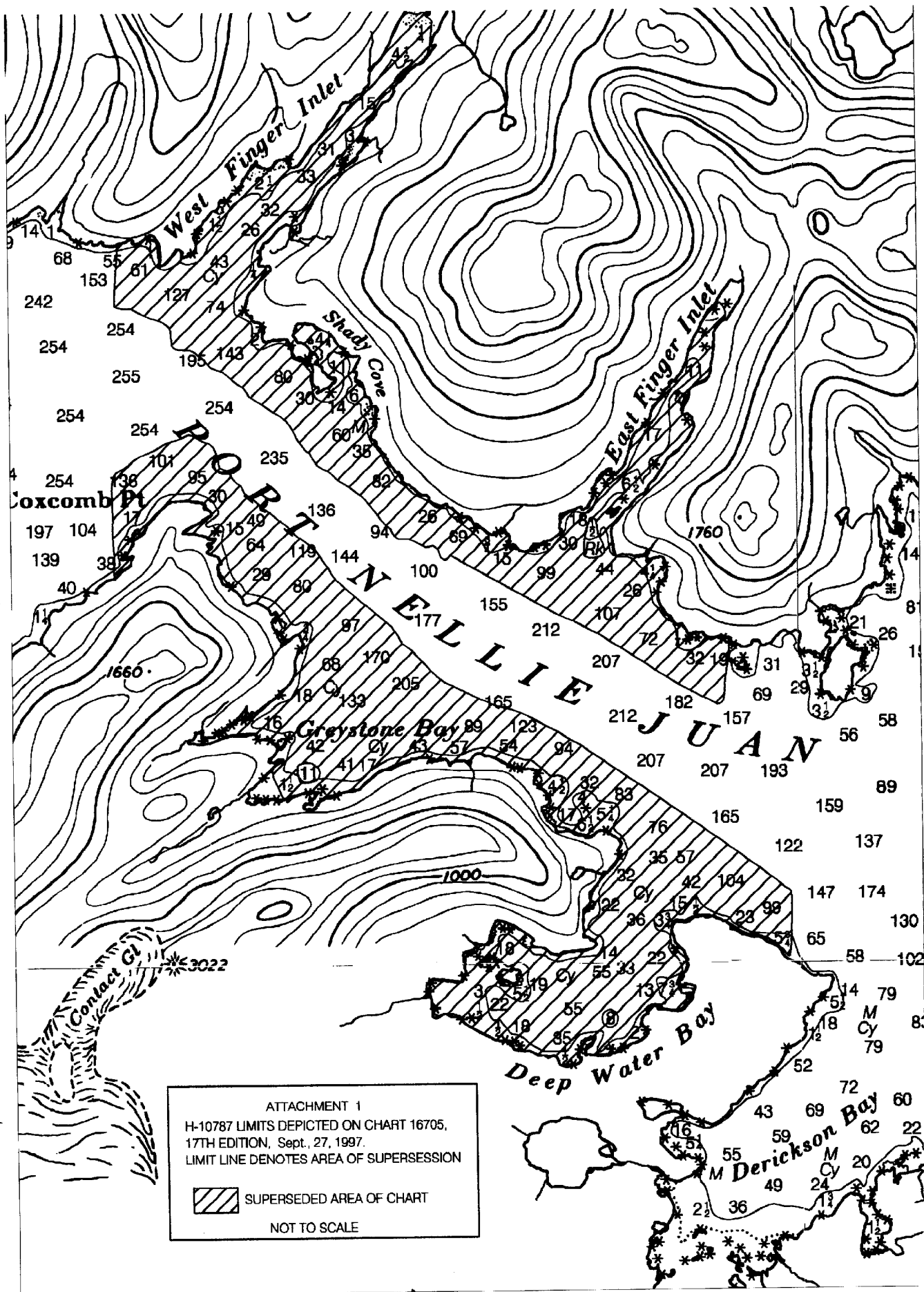
This is an adequate hydrographic survey. Additional fieldwork is recommended on a low priority basis to confirm or disprove the depths brought forward from the prior surveys, mention in section M of the hydrographer's report and section M of the Evaluation report.

**U. REFERRAL TO REPORTS**

Referral to reports is adequately discussed in the hydrographer's report.



Russ Davies  
Cartographer



APPROVAL SHEET  
H-10787

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Bruce A. Olmstead Date: 11/18/98  
Bruce A. Olmstead  
Senior Cartographer, Cartographic Section  
Pacific Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

James C. Gardner Date: 12/27/98  
James C. Gardner  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

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Final Approval

Approved:

Andrew A. Armstrong III Date: Jan 20, 1999  
Andrew A. Armstrong III  
Captain, NOAA  
Chief Hydrographic Surveys Division

MARINE CHART BRANCH  
**RECORD OF APPLICATION TO CHARTS**

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10787

**INSTRUCTIONS**

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
16705	11/23/98	Russ Davis	Full Part Before After Marine Center Approval Signed Via <i>Full Application of</i> Drawing No. <i>Sndgs, curves and features from smooth skul</i>
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.